

INTERIM WHOLE EFFLUENT TOXICITY IMPLEMENTATION GUIDELINES FOR ARIZONA

The Arizona Department of Environmental Quality (ADEQ) has adopted a narrative water quality standards for toxic substances [Arizona Administrative Code (AAC) R18-11-108.A.5] which states:

"Navigable waters shall be free from pollutants in amounts or combinations that..are toxic to humans, animals, plants, and other organisms;..."

Benchmark

In implementing the narrative toxic standard in Arizona, both acute and chronic toxicity procedures will be used. The criteria that will be used as a benchmark for determining whether a discharge causes or has reasonable potential to cause an exceedance of the narrative standard are the equivalent of 0.3 toxicity unit (0.3 TU_a) for acute toxicity, or 1.0 toxicity unit (1.0 TU_c), for chronic toxicity.

The TU_a is derived by dividing 100 by the concentration of effluent which is lethal to 50% of the test organisms (LC50). The TU_c is derived by dividing 100 by the No Observed Effect Concentration (NOEC) (EPA, 1991). The NOEC is the highest concentration of toxicant to which organisms are exposed to in a short term test, that causes no observable adverse effect on the test organisms (i.e., the highest concentration of toxicant to which the values for the observed responses are not statistically significant from the control). Both toxic unit criteria are adjusted for the appropriate dilution for a particular discharge. Where adequate dilution is not available, the acute toxicity will be benchmarked using the t-test at 100% effluent.

Chronic toxicity testing shall be conducted in accordance with the methods set forth in EPA's chronic toxicity testing manual (EPA/600/4-91/002).

Acute toxicity testing shall be conducted in accordance with the methods set forth in EPA's acute toxicity testing manual (EPA/600/4-90/027F).

Mixing Zones

Mixing zones (see AAC R18-11-114) may be considered in determining compliance with the narrative toxics standard.

Benchmark Toxicity Criteria:

Acute Criteria:

- 0.3 toxicity unit (0.3 TU_a)
• TU_a = 100/LC50

Chronic Criteria:

- 1.0 toxicity unit (1.0 TU_c)
• TU_c = 100/NOEC
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Waters Requiring Toxicity Monitoring

Toxicity monitoring for point sources other than stormwater will be required only on waters that have the following designated uses:

- Aquatic and wildlife/ warm water fishery (A&Ww);
- Aquatic and wildlife/ cold water fishery (A&Wc);
- Aquatic and wildlife/ effluent dominated water (A&Wedw)

Ephemeral Waters

Toxicity testing will not be routinely required for discharges to ephemeral waters. Also, toxicity testing will not be required for other waterbodies for which aquatic life habitation, growth or propagation has not been designated as a beneficial use. For ephemeral waters toxicity testing, if required, will depend on the beneficial uses and the species the water quality standards are intended to protect.

Toxicity Testing and Stormwater Permits

The control of toxics in stormwater shall be based upon the following:

- No toxicity testing will be required in the first cycle of municipal stormwater permits;
- Toxicity testing will not be routinely required for stormwater discharges to ephemeral waters; and
- A compliance schedule for a stormwater discharge shall require the implementation of all reasonable and cost-effective best management practices to control the discharge of pollutants in stormwater.

Ambient Toxicity Testing

Ambient toxicity testing would be used to determine a waterbody's compliance with the narrative toxics standard. Ambient toxicity testing directly measures receiving water toxicity from multiple sources and will employ the same test species and methods as for effluent toxicity testing.

REFERENCES

EPA. 1994. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms. Third Edition. EPA/600/4-91/002.

EPA. 1993. Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms. Fourth Edition. EPA/600/4-90/027F.

EPA. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water. EPA/505/2-90-001, PB91-127415.